



KZN Agriculture, Environmental Affairs & Rural Development
umNyango: ezoLimo ezeMvelo nokuThuthukiswa
kweMiphakathi yaseMakhaya
SIFUNDAZWE SAKWAZULU-NATALI

Basic Assessment Report
in terms of the
Environmental Impact Assessment Regulations, 2006 &
NEMA Amendment Act 2008

Kindly note that:

1. This **Basic Assessment Report** meets the requirements of Regulation 23 of the EIA Regulations, 2006 and is meant to streamline applications.
2. The report may be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **cross** the boxes that are applicable or **black out** the boxes that are not applicable in the report.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by this department for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. The report must be compiled by an independent environmental assessment practitioner.
7. Unless protected by law, all information in the report will become public information on receipt by this department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
8. This department may require that for specified types of activities in defined situations only parts of this report need to be completed. In addition, if it is clear to the EAP that because of the particular circumstances of the case it is not sensible to complete any of the sections indicated under paragraph 3 of this report, he or she may apply for exemption from completing that part of the report in the spaces provided in the report. It must however be noted that if the application for exemption is turned down, the report may have to be resubmitted.
9. The Environmental Assessment Practitioner ("EAP") must submit all Basic Assessment Reports, to registered interested and affected parties for a **40 day** commenting period. This will include all relevant state departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (3) of the National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).
10. No faxed or e-mailed reports will be accepted.
11. This document must be handed in or posted to the appropriate Regional Office of the KwaZulu-Natal Department of Agriculture and Environmental Affairs at one of the following addresses:

- **FOR APPLICATIONS IN NORTHERN KWAZULU-NATAL** (Amajuba, Umkhanyakude, Uthungulu, Umzinyathi and Zululand District Municipalities)

Environment: North Region
KwaZulu Natal Department of Agriculture and Environmental Affairs
Private Bag X1048
RICHARDS BAY
3900

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report Version 7, August 2009	Page 1 of 59
-------------------------------------------------------------------------------------------	---------------------------------------------------	--------------

4th Floor ABSA Building
 Lakeview Terrace
 RICHARDS BAY

Contact Person: Ms Zama Mbanjwa
 Telephone No.: (035) 780 6765

- **FOR APPLICATIONS IN SOUTHERN KWAZULU-NATAL** (Ethekwini Metro, Ilembe, Sisonke, Ugu, Umgungundlovu and Uthukela District Municipalities):

Environment: South Region
 KwaZulu-Natal Department of Agriculture and Environmental Affairs
 Private Bag X6005
 HILTON
 3245

A Block
 4 Pin Oak Avenue
 HILTON

Contact Person: Ms Mavis Padayachee
 Telephone No.: (033) 343 8428

COMPLETION OF THIS REPORT

Please indicate the numbers of the sections of this report that have not been completed:

Section C:	6(a)	6(b)	6(c)	6(d)	7	8	9(c)	9(e)	9(f)	9(g)	9(h)	11
Section D:	1	2	3	4	5	6						
Section E:	1(a)	1(b)	1(c)	1(d)	1(f)	1(g)	3					

Provide detailed reasons for not completing the sections indicated:

Section	Reasons for not completing

SECTION A: APPLICATION FOR EXEMPTION

Please provide details regarding any application for exemption from the requirements of the EIA Regulations, 2006:

Has an application for exemption been submitted to the Department?	<input type="checkbox"/>	NO
Has an Exemption Notice in respect of an application for exemption been issued?	<input type="checkbox"/>	NO
Is a copy of the Exemption Notice attached to this report? N/A	YES	NO

SECTION B: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	Arcus GIBB (Pty) Ltd.		
Physical address:	2nd Floor IBM House, 54 Norfolk Terrace, Westville, Durban		
Postal address:	PO Box 1365, Westville		
Postal code:	3630	Cell:	
Telephone:	031 267 8560	Fax:	031 2663310
E-mail:	rstow@gibb.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Educational qualifications	Experience in environmental assessments (yrs)
Russell Stow	BSc (Hons) Environmental Management	10
Rashieda Davids	BSc (Hons) Environmental and Geographical Science	5

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Educational qualifications	Experience in field of expertise
Adam Teixeira-Leite	Bsc (Hons) Environmental Science	3

SECTION C: ACTIVITY INFORMATION

1. PROJECT INFORMATION

a. Project title

PROPOSED INSTALLATION OF A TRUNK WATER MAIN IN ASSAGAY, DURBAN

b. Project description

Describe your project in detail:

The eThekweni Municipality: Water & Sanitation Unit (hereafter referred to as 'EWS') proposes to install a 400mm diameter steel water main pipeline (hereafter referred to as 'the Pipeline') within the road reserves of roads in the Assagay suburb in the Outer West Region of the eThekweni Municipality (see Appendix A, **Figure 1**). The proposed Pipeline will be approximately 2.9km long and will connect at Gevers Road to an existing water main in Fraser Road, Assagay. The Pipeline is intended to supplement the existing 200mm diameter water main that currently feeds the Summerhills area, where there is a growing demand for additional water.

The proposed Assagay Trunk Water Main Project requires environmental authorisation from the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) prior to construction. EWS appointed Arcus GIBB (Pty) Ltd. (GIBB) to undertake the Environmental Impact Assessment and to compile this Final Basic Environmental Assessment Report (BAR), as required by the National Environmental Management Act (No. 107 of 1998) (NEMA) and associated Environmental Impact Assessment (EIA) Regulations.

Background

The primary responsibility of EWS is to provide water and sanitation services to all customers in the eThekweni Municipality. Eradicating the backlog of the provision of both services is a key priority for the EWS. The water backlog has been reduced to 15% of the 1996 figure and the sewerage backlog stands at approximately 50% of the 1996 figure. The following goals have been identified by the EWS as pertinent to enable the eradication of the backlog of water and sanitation services:

- Reducing non-revenue water from the present level of 30%, to 25%, over the next 5 years
- Improving asset management systems
- Training young graduates in engineering and retaining skilled staff to respond to the shortage of engineers and professional skills in SA
- Improving performance management systems
- Improving customer services and services payment levels, which are currently just over 90%.

The eThekweni Municipality has set as a target of supplying all households in Durban with access to potable water within 5 years of June 2008. As part of reaching this target the EWS has identified the probable water shortages that are eminent with the rapid expansion of the Summerhills area. EWS therefore intends to install a secondary pipeline to supply

the additional water demand in the area.

Description of the Affected Environment

The Pipeline is proposed to be installed within the road reserve along various roads in the residential area of Assagay (see **Figure 2**). The alignment passes primarily through the residential portion of Assagay although it does bypass some business properties. The study area can, therefore, be described as mixed use in certain areas, and pure residential in others.

Three alternative route alignments have been identified. The preferred route alignment runs within the road reserve from a tie-in point at the intersection of Gevers and Assagay Roads, along Hlupeka Place and portions of Kassier Road, Assagay Crescent and Alverstone Road to the existing 400mm diameter main connection point in Fraser Road (see **Figure 2**). The total length of the route is 2.9km. Section 2 details the other alternatives considered in the engineering assessment.

Technical details of the proposed Pipeline

The Pipeline will be a 400mm diameter steel water main pipeline for the bulk supply of water to consumers. It will be laid in an approximately 1m wide by 3m deep trench. No household tie-in connections will be made directly to the Pipeline along its path through Assagay as it is a trunk main (bulk main) line.

Type of Piping and Method of Installation

The type of pipe to be used is a 400 mm diameter fusion bonded epoxy-lined pipe (externally), with a cementitious internal lining. The Pipeline will not be joined with any couplings but will be continuously welded, with each joint consisting of three welds. The first, a tacking weld, is done to position and hold the pipe in place. The second and the third will be continuous welds around the pipe both internally and externally. At points where valves, fire hydrants or tie in points are required along the pipeline, a flanged (class PN 16) will be welded onto the end of the pipe and the valves, fire hydrants, etc will be connected onto the pipe.

The Pipeline will be laid on a 100mm thick bedding cradle of river sand (above and below the pipe) and covered with a general 1m cover. The bedding material is free of stones/debris.

The EWS intend to install the Pipeline within the road reserve and stay outside of driveways and verges as far as possible, although some of the road reserve has been claimed as verges by residents. Where the Pipeline is installed within the road itself, the road will be rebuilt above it according to the standards defined by the class of the road.

2. ACTIVITY DESCRIPTION

Describe the activity / activities which is / are being applied for in detail:

The proposed installation of the Pipeline involves, inter alia, the following listed activities, as per Government Notice No. R. 544 of the National Environmental Management Act (No. 107 of 1998) (NEMA) Environmental Impact Assessment Regulations:

Activity Number 9: The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -

(i) with an internal diameter of 0,36 metres or more; or

(ii) with a peak throughput of 120 litres per second or more,

excluding where:

a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or

b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.

Activity Number 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing, dredging, excavation, removal or moving

(i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or

(ii) occurs behind the development setback line.

3. ALTERNATIVES

Describe alternatives that are considered in this application. Consideration of alternatives must not be limited to site and layout alternatives only. Alternatives assessed must include the consideration of alternative technologies, processes and activities by means of which the objectives of the proposed project may be achieved. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent for informed decision making.

2(a) Site alternatives:

EWS undertook to identify the best possible alignment for the proposed Pipeline covering the shortest distance while staying outside of private property and interrupting the fewest number of residences as possible.

Effort was made to identify a route alignment that would impact on the least number of interested and affected parties (IAPs), namely the Department of Transport (DOT) and residents of Assagay. The technical site requirements for the actual installation of the Pipeline were also considered such as areas of sufficient space for pipeline assemblage due to the size and welding requirements of the piping to be installed.

Describe site alternative 1 (S1), (**selected site**) for the activity described above, or for any other activity alternative:

Alternative 1 (S1): Gevers to Fraser Roads, Assagay – Preferred Alternative

The preferred route alignment, **S1**, is approximately 2.9km in length and runs within the road reserve from a tie-in point at the intersection of Gevers and Assagay Roads, along Hlupeka Place and portions of Kassier Road, Assagay Crescent and Alverstone Road to the existing 400mm diameter main connection point in Fraser Road (see **Figure 2**).

S1 is the longest of the three route alternatives with a number of bends. However, most of the Pipeline will be installed on the road verge and in the road, as there is sufficient space throughout the route. There would be only one reticulation line off this route and water interruptions would therefore be at a minimum.

S1 does not affect the DOT's proposed widening of Kassier Road and does not traverse private property. As the proposed Pipeline is a trunk main (bulk main) there will, therefore, be no household connections feeding off the Pipeline. However, it is important to note that water interruptions may be unavoidable during construction as a result of pipe connecting or unintended damage to pipes.

This alignment traverses approximately six (6) Transnet (previously 'Petronet') pipelines that cross just outside of 13 Assagay Crescent. EWS has obtained the necessary approval from Petronet to traverse its pipes at this point. However, this approval was granted with conditions which have been included in Section 2 of this BAR and in the Construction and Operational Environmental Management Programme (EMP) for the Pipeline project (**Appendix F**).

Describe site alternative 2 (S2), **if any**, for the activity described above, or for any other activity alternative:

Alternative 2 (S2): Lello Road

Alternative S2 starts at Lello Road in Assagay and follows an existing 200mm water main pipeline that currently feeds the Summerhills area and ends in Fraser Road (see **Figure 2**). This route alignment can be considered the least feasible being that there are several reticulation lines coming off this 200mm line, which would result in many interruptions to the water supply in the area during construction. In addition, the road is very narrow and vehicle access would have to be restricted while the Pipeline is being installed, thereby inconveniencing residents living along the route.

Since the existing 200m pipeline would still be in operation while the new Pipeline was being installed, the proposed Pipeline would need to be installed a minimum of 1m away from the existing 200mm pipeline to avoid damage thereto and resulting disruptions in water supply. Furthermore, as there is no indication on site of where the existing 200mm pipe is, thus the chances of damaging the pipeline would be further increased. This existing 200mm pipeline also traverses private property, which EWS aims to avoid.

For the reasons stated above, **Alternative S2** has been disqualified from further consideration.

Describe site alternative 3 (S3), **if any**, for the activity described above, or for any other activity alternative:

Alternative 3 (S3): Along Kassier Road

Alternative S3 follows from the northern section of Kassier Road to the existing 400mm diameter main connection point in Fraser Road (see **Figure 2**). Initially, alignment in the road reserve adjacent to Kassier Road was identified as the preferred alignment due to it being the shortest possible route between the two (2) tie-in points. However, this option has been ruled out as the DOT, who administers Kassier Road, intend to widen it in the near future. Thus, DOT has stated that no pipelines may be laid within the 30m road reserve along the majority of the length of Kassier Road. **Alternative S2** has therefore been discarded.

Alternative S3: No-Go Alternative

The No-Go alternative, **S4**, would imply that the status quo remains and the Pipeline would not be installed. Not undertaking the proposed project would result in the demand for additional water to the Summerhills area not being supplied. This would contravene EWS' target to supply potable water to all households in Durban. Furthermore, social benefits related to the supply of potable water, including improved quality of life and health would not be realised for the expanding Summerhills community.

2(b) Layout alternatives: N/A

Describe layout alternative 1 (L1), if any for the activity described above, or for any other activity alternative:
Describe layout alternative 2 (L2), if any, for the activity described above, or for any other activity alternative:
Describe layout alternative 3 (L3), if any, for the activity described above, or for any other activity alternative:

2(c) Process (technology) alternatives: N/A

Describe site alternative 1 (P1), if any for the activity described above, or for any other activity alternative:
Describe site alternative 2 (P2), if any, for the activity described above, or for any other activity alternative:
Describe site alternative 3 (P3), if any, for the activity described above, or for any other activity alternative:

4. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:

- Alternative S1¹ (preferred site alternative)
- Alternative S2 (if any)
- Alternative S3 (if any)

Latitude (S):		Longitude (E):	
°	'	°	'
°	'	°	'
°	'	°	'

In the case of linear activities:

Alternative

Alternative: S1 (preferred alternative)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):		Longitude (E):	
30°	44'59"	-29°	46'25"
30°	44'44"	-29°	46'56"
30°	44'19"	-29°	47'27"

Alternative: S2

Alternative S1 (preferred alternative)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):		Longitude (E):	
30°	44'18"	-29°	45'55"
30°	44'20"	-29°	46'42"
30°	44'19"	-29°	47'27"

Alternative: S3	Latitude (S):	Longitude (E):
Alternative S1 (preferred alternative)		

¹ "Alternative S.." refer to site alternatives.

• Starting point of the activity				
• Middle point of the activity				
• End point of the activity				

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500 meters along the route for each alternative alignment.

See Appendix C for route co-ordinates at 500m intervals.

5. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the proposed activity as related to layout alternatives.

For a linear activity, the physical size is calculated as [Length] x [servitude width]

Alternative:

Alternative L1² (preferred layout alternative)

Alternative L2 (if any)

Alternative L3 (if any)

Size of the layout

2900 m ²
N/A
N/A

or, for linear activities: S2 & S3

Alternative:

Alternative L1 (S1)

Alternative L2 (if any)

Alternative L3 (if any)

Length of the activity:

2900 m ²
N/A
N/A

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative S1 (preferred site alternative)

Alternative S2 (if any)

Alternative S3 (if any)

Size of the site/servitude:

m ²
m ²

6. SITE ACCESS

Does ready access to the site exist, or is access directly from an existing road?

YES	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

N/A

Include the position of the access road on the site plan.

7. WASTE, EFFLUENT AND NOISE MANAGEMENT

Please note that the following environmental issues must be described for each alternative site, layout and process.

a. Solid waste management

Will the activity produce solid waste during the construction/initiation phase?

YES	<input checked="" type="checkbox"/>
~ 50 m ³	<input type="checkbox"/>

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

Construction solid waste will be removed from site by the contractor and disposed of in the Municipal waste stream.

Where will the construction solid waste be disposed of (describe)?

The Municipal landfill site

Will the activity produce solid waste during its operational phase?

<input checked="" type="checkbox"/>	NO
	m ³

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

N/A

² "Alternative A.." refer to activity, process, technology or other alternatives.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, this must be brought to the attention of the competent authority.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? YES NO

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for, for that of a solid waste handling or treatment facility? YES NO

If yes, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. N/A

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:		N/A	
Has a specialist been consulted to assist with the completion of this section?		<input checked="" type="checkbox"/>	NO
If YES, please complete: N/A			
Name of the specialist:	-		
Qualification(s) of the specialist:	-		
Postal address:	-		
Postal code:	-		
Telephone:	-	Cell:	-
E-mail:	-	Fax:	-
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
Signature of specialist:	-	Date:	-

b. Liquid effluent

Will the activity produce effluent, other than domestic sewage? YES NO

If yes, what estimated quantity will be produced per month?

N/A

If not, how will this effluent be disposed of?

Will the activity produce any effluent that will be treated and/or disposed of on site?		<input checked="" type="checkbox"/>	NO
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.			
Will the activity produce effluent that will be treated and/or disposed of at another facility?		<input checked="" type="checkbox"/>	NO
If yes, provide the particulars of the facility: N/A			
Facility name:	-		
Contact person:	-		
Postal address:	-		
Postal code:	-		
Telephone:	-	Cell:	-
E-mail:	-	Fax:	-
Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any: N/A			
Has a specialist been consulted to assist with the completion of this section? : N/A		<input checked="" type="checkbox"/>	NO
If YES, please complete			
Name of the specialist:	-		
Qualification(s) of the specialist:	-		
Postal address:	-		
Postal code:	-		
Telephone:	-	Cell:	-
E-mail:	-	Fax:	-
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
Signature of specialist:	-	Date:	-

c. Emissions into the atmosphere

Will the activity release emissions into the atmosphere? YES NO

If yes, is it controlled by any legislation of any sphere of government? N/A

YES NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Relatively insignificant quantities of exhaust fumes will be emitted due to use of construction vehicles and equipment.

It is recommended that the contractor ensures that construction vehicles and equipment are well maintained. This condition has been incorporated into the EMP (**Appendix F**).

Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete:

Name of the specialist:	-		
Qualification(s) of the specialist:	-		
Postal address:	-		
Postal code:	-		
Telephone:	-	Cell:	-
E-mail:	-	Fax:	-
Are any further specialist studies recommended by the specialist?			YES NO
If YES, specify:			
If YES, is such a report(s) attached?			YES NO
Signature of specialist:	-	Date:	-

d. Generation of noise

Will the activity generate noise? YES NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Construction noise will result from movement of construction vehicles, digging of trenches and pipeline assembly (welding) and will be limited to daytime work hours only.

Any public noise complaints would be dealt with through the normal eThekweni Health procedures.

Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete:

Name of the specialist:	-		
Qualification(s) of the specialist:	-		
Postal address:	-		
Postal code:	-		
Telephone:	-	Cell:	-
E-mail:	-	Fax:	-
Are any further specialist studies recommended by the specialist? N/A			YES NO
If YES, specify:			
If YES, is such a report(s) attached?			YES NO
Signature of specialist:	-	Date:	-

8. WATER USE

Please note that the following issue must be described for each alternative site, layout and process.

Please indicate the source(s) of water that will be used for the activity by crossing the appropriate box(es)

Municipal	<input checked="" type="checkbox"/> water-board	<input type="checkbox"/> groundwater	<input type="checkbox"/> river, stream, dam or lake	<input type="checkbox"/> other	<input type="checkbox"/> the activity will not use water
-----------	-------------------------------------------------	--------------------------------------	-----------------------------------------------------	--------------------------------	----------------------------------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use permit from the Department of Water Affairs and Forestry? YES NO

If yes, please submit the necessary application to the Department of Water Affairs and Forestry and attach proof thereof to this application if it has been submitted.

It was initially thought that a water use authorisation may be required given that a portion of the proposed pipeline will traverse a disturbed wetland on the corner of Kassier Road and Hlupeka Place. However, Mr Norman Ward of the Department of Water Affairs confirmed in writing (Appendix E7, email correspondence dated on 13 January 2011) that a water use authorisation would not be necessary for the pipeline. This is as a result of the pipeline being proposed to be buried below the wetland, which will be rehabilitated to a better condition post construction. Additionally, the Environmental Management Programme includes adequate measures for the mitigation of impacts on the wetland and associated stream during construction and operation of the pipeline.

9. ENERGY EFFICIENCY

Please note that the following issue must be described for each alternative site, layout and process.

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The proposed Pipeline will be fully gravity-fed, thus reducing the need for electrical pumps. Maintenance costs are also minimal if no pumps are required.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N/A

10. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document. The site or route plans must indicate the following:

- 10(a) the scale of the plan (appropriate to the extent of the development);
- 10(b) the property boundaries and erf or farm numbers of the adjoining properties;
- 10(c) the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 10(d) the position of each element of the application as well as any other structures on the site;
- 10(e) the position of services (e.g. electricity supply cables, water supply pipelines, boreholes, sewage pipelines and storm water infrastructure) including servitudes and the purpose of such servitudes;
- 10(f) sensitive environmental elements on the site/s and within 100m of the site/s including (but not limited thereto):
 - Rivers, streams and drainage lines;
 - wetlands;
 - the 1:100 year flood line (where available or where it is required by DWAF);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation including protected plant species (even if it is degraded or invested with alien species);
- 10(g) contour intervals appropriate to the scale of the development must be indicated on the plan; and
- 10(h) the positions from where photographs of the site were taken must be indicated.
- 10(i) a detailed viewshed illustration (where appropriate)

11. SITE PHOTOGRAPHS

Colour photographs must include important features of the site and a description of each photograph must be provided. Photographs must be attached under Appendix B to this form.

12. ACTIVITY MOTIVATION

12(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development phase of the activity?

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

R 8 000 000
R to be determined
YES
YES
None
R N/A
N/A
None
R 0
N/A

12(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The pipeline is being proposed in response to an increased demand for water supply in the Summerhills area. This is a direct result of the recent and planned expansion of Summerhills. The proposed Pipeline will provide support to the existing 200mm diameter water main pipeline and boost water supply to the area.

Indicate any benefits that the activity will have for society in general:

The proposed pipeline will ensure supply of potable water to Summerhills and will be inline with EWS's service requirements to ensure basic service delivery to the residents of Summerhills. Social benefits associated with access to potable water include improved quality of life and health.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

As above.

13. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:

Administering authority:

Date:

The Constitution of the Republic of South Africa, Section 24 (Environmental Right): "1) Everyone has the right : a) to an environment that is not harmful to their health or well-being; and b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that i) prevent pollution and ecological degradation; ii) promote conservation; and iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."	The Constitutional Assembly	1996
National Environmental Management Act No. 107 of 1998	National Department of Environmental Affairs (DEA)	1998
eThekwini Bylaws	eThekwini Municipality	
Occupational Health and Safety Act, Act No. 85	Department of Labour	1993

	Alternative S1 (preferred site):	Alternative S2 N/A	Alternative S3 N/A
Shallow water table (less than 1.5m deep)	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Dolomite, sinkhole or doline areas	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Seasonally wet soils (often close to water bodies)	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Unstable rocky slopes or steep slopes with loose soil	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Dispersive soils (soils that dissolve in water)	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Soils with high clay content (clay fraction more than 40%)	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Any other unstable soil or geological feature	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
An area sensitive to erosion	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
For a small portion of the route alignment only below Assagay Crescent in the vicinity of Kingfisher Lane.			

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where available / they exist, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Has a specialist been consulted to assist with the completion of this section?	<input checked="" type="checkbox"/>	NO
If YES, please complete: N/A		
Name of the specialist:	-	
Qualification(s) of the specialist:	-	
Postal address:	-	
Postal code:	-	
Telephone:	-	Cell: -
E-mail:	-	Fax: -
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify: N/A		
If YES, is such a report(s) attached?	YES	NO
Signature of specialist:	-	Date: -

4. GROUND COVER

Cross the types of groundcover present on the site.

Alternative S1:

<input checked="" type="checkbox"/>	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Paved surface	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

If any of the boxes marked with an ^E "are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

The proposed Pipeline flows along the road reserve which is currently occupied by paved or grassed verges, with a wetland being traversed at one point along the route.

Has a specialist been consulted?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
If YES, please complete the following:	
Name of the specialist:	Mr Adam Teixeira-Leite of the Institute of Natural Resources (INR)
Qualification(s) of the specialist:	BSc (Hons) Environmental Science Experience in wetland and riparian vegetation assessments
Postal address:	P.O Box 100396, Scottsville

Postal code:	3209		
Telephone:	033 346 0796	Cell:	
E-mail:	aleite@ukzn.ac.za	Fax:	033 346 0895
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	<input type="checkbox"/>		NO
If YES, specify and explain:			
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	<input type="checkbox"/>	
If YES, specify and explain:			

The *eThekweni Trunk Water Main Pipeline: Specialist Aquatic Assessment, INR report No 402/09* undertaken by the Institute of Natural Resources (INR) is summarized below and included in **Appendix D1**.

The Pipeline is proposed to traverse a channelled wetland area upstream of the culvert beneath Kassier Road, at the intersection of Kassier Road and Hlupeka Place (Plates 9, 13 and 14). The INR was commissioned to undertake an Aquatic Assessment of the aforementioned wetland area, which included the following tasks:

- Map the basic extent of the wetland
- Classify the type of wetland occurring
- Assess the basic condition and importance of the wetland system
- Recommend mitigation measures to be applied during pipeline installation through the wetland
- Suggest ways to rehabilitate the wetland and channel once pipeline construction has been completed.

The Aquatic Assessment concluded the following:

The wetland area under consideration has been previously impacted by development, with modification to the natural hydrological functioning of the channel occurring, as well as the colonisation of the channel and wetland zone by exotic plants and trees.

Beneath Kassier Road, the channel runs (Plate 15) with flow inputs from upstream as well as a drain (Plate 10 and Figure 1) running parallel to Kassier Road from the north-east. A 1m wide gabion structure (Plates 16, 17 and Figure 1) has been placed transversely across the channel just above the inlet into the culvert below Kassier Road. It is assumed that this artificial structure was probably installed to attenuate storm flows and provide some form of erosion control and channel stabilisation within the stream.

Based on the presence of the gabions, it is understood that flows may be quite substantial through this stream channel. Thus, there is the potential for the channel to flood back quite considerably and inundate the channel sides during periods of heavy rain.

The system can be described as transformed, with the following general characteristics being applicable:

- A modified hydrological regime caused by the road construction and increased inputs from hardened surfaces, as well as the disruption of flow caused by the construction of a gabion weir/revetment³ across the channel (which appears to have been emplaced to control storm flows and combat channel erosion).

³ a facing added to a structure such as a wall or building that provides additional support

- Flow restriction and sedimentation upstream of the road culvert.
- Colonisation of the channel by indigenous vegetation dominated by Antelope grass (*Echinocloa pyramidalis*), with a few bulrushes (*Typha capensis*), and Madumbes.
- Invasion by numerous exotic plants/trees including gum trees (*Eucalyptus*), Spanish reed (*Arundo donax*), Jobs tears (*Canna indica*) Black Wattle (*Acacia mearnsii*), Bugweed (*Solanum mauritianum*) and Common Lantana (*Lantana camara*).

Aquatic Impact Statement

The potential impacts of the proposed Pipeline on the wetland channel can be effectively mitigated during the construction phase and also so as not to interfere with stream and wetland functioning during operation. Recommendations for mitigation of impacts in the wetland channel during construction and operation of the Pipeline are provided in Section 2 and have been incorporated into the EMP (Appendix F).

Are any further specialist studies recommended by the specialist?	<input checked="" type="checkbox"/>	NO
If YES, specify:		
If YES, is such a report(s) attached?	<input type="checkbox"/>	<input type="checkbox"/>

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S2: N/A

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an ^{“E”} are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

Has a specialist been consulted?	<input type="checkbox"/>	<input type="checkbox"/>
If YES, please complete the following:		
Name of the specialist:		
Qualification(s) of the specialist:		
Postal address:		
Postal code:		
Telephone:		Cell:
E-mail:		Fax:
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	<input type="checkbox"/>	<input type="checkbox"/>
If YES, specify and explain:		
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	<input type="checkbox"/>	<input type="checkbox"/>
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	<input type="checkbox"/>	<input type="checkbox"/>
If YES, specify:		
If YES, is such a report(s) attached?	<input type="checkbox"/>	<input type="checkbox"/>
Signature of specialist:		Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S3: : N/A

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
--------------------------------------------	-------------------------------------------------	--------------------------------------------------------	----------------------------------------------	---------

Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil
-------------	-----------------	---------------	-----------------------------	-----------

If any of the boxes marked with an "E" are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

Has a specialist been consulted?	YES	NO
If YES, please complete the following:		
Name of the specialist:		
Qualification(s) of the specialist:		
Postal address:		
Postal code:		
Telephone:		Cell:
E-mail:		Fax:
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES	NO
If YES, specify and explain:		
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached?	YES	NO
Signature of specialist:		Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site
Alternative S1, S2 and S3:

Natural area	Low density residential	Medium density residential		
Retail	Commercial & warehousing			
	Office/consulting room			Hospitality facility
Hospital/medical center/clinic				
			River, stream or wetland	

If any of the boxes marked with an "N" are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?		NO
If YES, please complete the following:		
Name of the specialist:	-	
Qualification(s) of the specialist:	-	
Postal address:	-	
Postal code:	-	
Telephone:	-	Cell: -

E-mail:	-	Fax:	-
Will the ambient noise level have a negative impact on the proposed activity?			
		YES	NO
If YES, specify and explain:			
Are any further specialist or studies recommended by the specialist?			
		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?			
		YES	NO
Signature of specialist:		-	Date: -

If any of the boxes marked with an "A" are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?			
		YES	NO
If YES, please complete the following:			
Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	
Will the ambient air pollution level have a negative impact on the proposed activity?			
		YES	NO
If YES, specify and explain:			
Are any further specialist studies recommended by the specialist?			
		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?			
		YES	NO
Signature of specialist:		-	Date: -

If any of the boxes marked with an "H" are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?			
		YES	NO
If YES, please complete the following:			
Name of the specialist: -			
Qualification(s) of the specialist: -			
Postal address: -			
Postal code: -			
Telephone: -		Cell: -	
E-mail: -		Fax: -	
Will the surrounding land use pose any unacceptable health risk on the proposed activity?			
		YES	NO
If YES, specify and explain:			
Are any further specialist studies recommended by the specialist?			
		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?			
		-	-
Signature of specialist:		-	Date: -

Alternative S2 (if any): N/A

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an "N" are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?		YES	NO
If YES, please complete the following:			
Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	
Will the ambient noise level have a negative impact on the proposed activity?		YES	NO
If YES, specify and explain:			
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
Signature of specialist:		Date:	

If any of the boxes marked with an "A" are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?		YES	NO
If YES, please complete the following:			
Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	
Will the ambient air pollution level have a negative impact on the proposed activity?		YES	NO
If YES, specify and explain:			
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
Signature of specialist:		Date:	

If any of the boxes marked with an "H" are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?		YES	NO
If YES, please complete the following:			
Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	
Will the surrounding land use pose any unacceptable health risk on the proposed activity?		YES	NO
If YES, specify and explain:			
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
Signature of specialist:		Date:	

Alternative S3 (if any): N/A

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home

Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an "N" are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?	YES	NO
If YES, please complete the following:		
Name of the specialist:		
Qualification(s) of the specialist:		
Postal address:		
Postal code:		
Telephone:		Cell:
E-mail:		Fax:
Will the ambient noise level have a negative impact on the proposed activity?	YES	NO
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached?	YES	NO
Signature of specialist:		Date:

If any of the boxes marked with an "Au" are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?	YES	NO
If YES, please complete the following:		
Name of the specialist:		
Qualification(s) of the specialist:		
Postal address:		
Postal code:		
Telephone:		Cell:
E-mail:		Fax:
Will the ambient air pollution level have a negative impact on the proposed activity?	YES	NO
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached?	YES	NO
Signature of specialist:		Date:

If any of the boxes marked with an "H" are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?	YES	NO
If YES, please complete the following:		
Name of the specialist:		
Qualification(s) of the specialist:		
Postal address:		
Postal code:		
Telephone:		Cell:
E-mail:		Fax:
Will the surrounding land use pose any unacceptable health risk on the proposed activity?	YES	NO
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached?		
Signature of specialist:		Date:

6. CULTURAL/HISTORICAL FEATURES

Alternative S1 (preferred site)

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

	NO
Uncertain	

If YES, explain:

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

In response to the draft Basic Assessment Report, AMAFA KwaZulu-Natal Heritage Authority requested that a Heritage Impact Assessment (HIA) be undertaken of the proposed Assagay pipeline route. Arcus GIBB appointed eThembeni Cultural Heritage to undertake the study, which was completed in November 2010. The *Heritage Impact Assessment of Proposed Installation of Assagay Trunk Water Main, Ethekwini Metropolitan Municipality, Kwazulu-Natal, South Africa* is summarized below and included in **Appendix D2**.

The HIA reported the following on the area/s proposed to be affected by the pipeline installation:

- No heritage resources were identified within the proposed development area
- No mitigation or monitoring measures are recommended.

Heritage Impact Statement

The HIA concluded with the recommendation that the development may proceed with no further heritage mitigation. eThembeni Cultural Heritage have submitted the HIA report to Amafa aKwaZulu-Natal in fulfilment of the requirements of the National Heritage Resources Act. If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify Amafa aKwaZulu-Natal should any heritage resources, as defined in the Act, be discovered during the course of development activities.

Will any building or structure older than 60 years be affected in any way?

	NO
	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

Alternative S2 N/A

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
If YES, explain:	Uncertain	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

Alternative S3 N/A

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
If YES, explain:	Uncertain	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.		

Are any further specialist studies recommended by the specialist?	<input checked="" type="checkbox"/>	NO
If YES, specify:		
If YES, is such a report(s) attached?		
Signature of specialist:		Date:

SECTION E: PUBLIC PARTICIPATION

Arcus GIBB conducted a Public Participation Process (PPP) with the following key features and associated milestones:

- An Interested and Affected Parties (IAPs) Register/ Database was initiated and progressively populated as IAPs were identified or registered. (Appendix E1.)
- Media notices which informed readers on the application to DAEARD and the proposed Pipeline and invited IAPs to register as an IAP and/or provide comment was placed in (Appendix E2):
 - *The Metro* – 13 March 2009
 - *The Highway Mail* – 18 March 2009
- Notice boards were designed based on the specification of the NEMA EIA Regulations GNR 385, Section 56(3), and displayed at conspicuous places on 19 March 2009. (Appendix E3 and Plates 18 - 23)
- A Background Information Document (BID), which provides background to the proposed Pipeline and an overview of the Basic Assessment Process and associated Public Participation Process, was compiled. The BID also included an invitation for IAPs to comment and raise any issues and concerns they may have (Appendix E4). The BID was posted, emailed and /or hand delivered to all listed properties along the preferred route as well as identified key IAPs.
- The Draft Basic Assessment Report (BAR) was made available for a public comment period of 40 days and everyone registered on the IAP Database was either notified of the availability of the report at certain venues or provided with an electronic and/or paper copy of the report. The Comments and Responses Register was updated with all comments received on the draft BAR, with responses to all comments provided therein.
- A Comments and Response Register was compiled, which includes IAPs comments on the BID, media notices, posters and Draft Basic Assessment Report. (Appendix E6.)

Please note that details of all components of this section must be included under Appendix E to this report.

1. ADVERTISEMENT

The environmental assessment practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.

Arcus GIBB attached five notice boards - one each on Frazer Road, Hlupeka Place, Assagay Road, Assagay Crescent and Alverstone Road (Appendix E3 and Plates 18 - 23).

- 1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority

Making use of the eThekweni Municipality's database, Arcus GIBB identified the owners of the properties close to the proposed site S1. These parties and occupiers of adjacent or nearby land to S1 were informed about the proposed Pipeline and Basic Assessment process through

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report Version 7, August 2009	Page 24 of 59
-------------------------------------------------------------------------------------------	---------------------------------------------------	---------------

the abovementioned PPP role-out. All identified landowners and occupants were registered on the IAPs Register/Database and are accordingly kept informed on the Basic Assessment progress and procedures. However, the Draft BAR was further distributed for comment to those residents along S2: Lello Road.

- 1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;

Refer to comment under 1(b) above.

- 1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;

The Ward Councillor and other community representatives that were included on the IAP database and were accordingly kept informed on the Basic Assessment progress and procedures, include the following:

Name	Surname	Designation	Organisation
Lillian	Davis	Chairperson	Assagay Ratepayers Association
Alan	Childs	Representative	WESSA / Envirowest
Mbongelwa	Phetha	eThekwini Ward Councillor	eThekwini Ward 8 Assagay

- 1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and

The eThekwini Municipality was contacted and accordingly kept informed on the Basic Assessment progress and procedures, through the following representatives:

Name	Surname	Designation	Organisation
Kuben	Samie	Environmental Assessment Officer	eThekwini Municipality Capital Projects: Environmental Management Department
Penny	Croucamp	Manager	eThekwini Municipality Development Assessment: Environmental Management Department

- 1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and

Organs of State that were included on the IAP database and accordingly kept informed of the Basic Assessment progress and procedures, include the following:

Name	Surname	Designation	Organisation
Sello	Mokhanya	Principal Heritage Officer	AMAFA
Renelle	Pillay	Water Pollution Control Officer	Department of Water Affairs and Forestry
Andrew	Blackmore	Head: Integrated Environmental	Ezemvelo KwaZulu-Natal Wildlife

		Management Planning	
--	--	------------------------	--

1(g) place a notice in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

Media notices which informed readers on the application to DAEARD and the proposed Pipeline and invited IAPs to register as an IAP and/or provide comment was placed in (Appendix E2):

- *The Metro – 13 March 2009*
- *The Highway Mail – 18 March 2009*

2. CONTENT OF ADVERTISEMENTS AND NOTICES

Advertisements and notices must indicate that an application will be submitted to the competent authority in terms of the EIA regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made;

Media notices adhered to these requirements.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for site alternatives where appropriate.

N/A

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. **Please note** that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

Arcus GIBB followed procedures in keeping with NEMA EIA Regulation GNR 385 and associated PPP Guidelines.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

All comments received from IAPs during the PPP for the proposed Pipeline and corresponding Arcus GIBB or client responses, are incorporated in the Comments and Response Register (Appendix E5). Copies of comments received and associated responses are provided in Appendix E6 and E7 respectively.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

Has any comment been received from the district municipality?

	NO
--	----

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Has any comment been received from the local municipality?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

eThekwini Municipality Traffic Authority commented the following:

Stated that any road closures or deviations proposed must be discussed and approved by the eThekwini Traffic Authority (Vishay Hariram: Manager: Traffic Operations)

eThekwini Environmental Department commented the following:

- Requested that detailed layout maps / plans meeting the requirements as detailed in the guide document: "Environmental Impact Assessment for capital Projects: Administrative Roles and Responsibilities" be provided in the Basic Assessment Report and that the layout show the alignment of the pipe and any associated infrastructure in relation to the existing (including adjacent) environment. Sensitive areas, (i.e river crossings) must be shown in greater detail.
- Stated that construction and operation phase impacts to the river/stream crossings must be adequately mitigated and these areas must be rehabilitated after construction activities have been completed.
- Requested that impacts to riparian areas and/or adjacent wetlands and vegetation along the alignment be assessed.
- Requested that erosion hindering structures must be placed in and along area that are susceptible to erosion to reduce and prevent any further soil erosion and subsequent sedimentation.
- Stated that wetland areas and other environmentally sensitive areas must be suitably and visibly demarcated and cordoned off prior to, and during construction activities.

Has any comment been received from a traditional authority?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

The following Key Stakeholders have been identified and been informed about the proposed Pipeline:

- AMAFA KwaZulu-Natal Department
- Department of Water Affairs (DWA)
- Ezemvelo KwaZulu-Natal Wildlife (Ezemvelo)
- WESSA KZN Region
- Transnet Pipelines.
- Department of Transport

Only comment from the Stakeholders listed below have been received and these have been

recorded in the Comments and Response Report (Appendix E5).

Transnet Pipelines (Petronet):

- Confirmed that they have no objection to the proposed Assagay pipeline crossing the 323.8mm and 406.4mm diameter pipelines within Transnet's 6.1m and 6m wide pipeline servitudes respectively, subject to compliance to their standard crossing conditions and requirements.
- The authority to proceed was valid for 6 months from the 6 June 2009 and an extension of time must be requested should construction not commence within the 6 months period.

AMAFA KwaZulu-Natal Department

- Requested that a Heritage Impact Assessment be undertaken by an AMAFA accredited heritage Practitioner in terms of the National Heritage Resources Act No. 25 of 1999

Department of Water Affairs (DWA)

- DWA provided a number of mitigation measures to be incorporated into the EMP during the construction phase of the project. These are reported on the Appendix E5, Comments and Repose Report and have been included into the EMP, Appendix F
- Mr Norman Ward of the DWA confirmed in writing (Appendix E7, email correspondence dated on 13 January 2011) that a water use authorisation would not be necessary for the pipeline. This is as a result of the pipeline being proposed to be buried below the wetland, which will be rehabilitated to a better condition post construction. Additionally, the Environmental Management Programme includes adequate measures for the mitigation of impacts on the wetland and associated stream during construction and operation of the pipeline.

Department of Transport (DOT)

- Based on review of the Draft Basic Assessment Report and site visit on the 6 April 2011 by Mr N. Shawe (Control Technician), the DOT has no objection to the proposed pipeline construction.

Comments received from other IAPs, namely residents of Assagay, have been recorded in Appendix E5.

SECTION F: IMPACT ASSESSMENT

As previously mentioned in Section 3, Alternatives S2 and S3 have been disqualified from further investigation due to a number of factors rendering S2 and S3 unfeasible. As such, the Impact Assessment of S2 and S3 has been omitted from this section of the report.

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

Please note that details of all components of this section must be included under Appendix F to this report.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the issues raised by interested and affected parties.

Refer to Appendix E5 : Comments and Response Report

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

Refer to Appendix E5 : Comments and Response Report

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

Alternative S1 (preferred alternative)

Direct impacts:

None

Indirect impacts:

None

Cumulative impacts:

None

Alternative S2 N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3 N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

- The residents of Summerhills will not receive the additional water they require.
- The social benefits associated with access to potable water, including improved health and quality of life would not be realised.
- Should the project not go ahead, time and resources spent on planning and design by eThekweni Municipality would be lost.

Indirect impacts:

None

Cumulative impacts:

None

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
N/A	N/A	N/A

b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A3 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:
N/A	N/A	N/A

3. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Alternative S1 (preferred site)

Direct impacts:

Potential direct impacts that could occur due to the installation of the Pipeline on **S1** include:

Wetland impacts:

- Disturbance of wetland vegetation and habitat
- Disturbance of wetland soils and alteration of wetland geomorphology
- Erosion and sedimentation from construction activities
- Invasion by exotic plants

Stream / drainage line impacts:

- Alteration of hydrological functioning within the stream channel
- Pollution of the immediate and downstream environment (hazardous substances and general wastes)
- Impact on stream morphology
- Disturbance of in-stream habitat

Construction related direct impacts:

- Traffic disturbance and congestion to residents and commuters along affected roads in Assagay
- Closure of Gevers Road (when Pipeline is installed across it)
- Water interruptions
- Nuisance Impacts
 - Visual and aesthetic impacts of construction activity
 - Noise impact of construction vehicles and equipment
- Positive impact associated with the provision of additional potable water to residents of Summerhills
- Potential spillage of hazardous material such as oil or fuel.

Indirect impacts:

Construction related indirect impacts:

- Potential construction litter
- Contamination of water courses from spilled hazardous materials (e.g. oil or fuel)
- Potential smoke emissions from construction activities.

Cumulative impacts:

Construction related cumulative impacts

- Disturbance to residents
- Downstream contamination of river system

Alternative S2 N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

The residents along the route alignment in the Assagay area will not be affected by construction activities. Additionally, wetland and stream / drainage line impacts will not occur.

The Summerhills area will be negatively impacted in that the residents there will not be serviced with potable water should the No-go alternative be approved.

Indirect impacts:

None.

Cumulative impacts:

None.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

Construction Phase Mitigation Measures

1. Wetland and stream impacts

a) Disturbance of wetland vegetation and habitat

- The construction zone should be clearly demarcated prior to the commencement of construction activities to ensure that activities do not unduly disturb the wetland/riparian zone ("No-go" areas outside of the construction zone should be defined).
- Minimise the width of the construction servitude across the wetland zone.
- Areas to be cleared of vegetation will need to be demarcated.
- Once identified, indigenous wetland plant species (*Typha capensis* mainly) requiring removal shall be removed appropriately with their root ball intact.
- Wetland vegetation removed shall be stockpiled neatly on the periphery of the area being stripped, for use in wetland rehabilitation.
- Stockpiled vegetation is to be properly demarcated such that it is not unnecessarily disturbed by construction activities.
- Wetland vegetation should be placed in a shaded area or covered using an appropriate material and kept moist.
- Any indigenous grasses may be retained for use in rehabilitation of the channel.
- Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation.

b) Disturbance of wetland soils and alteration of wetland geomorphology

- Servitude width should be minimised as far as possible within the wetland zone.
- Wetland topsoil (top 300mm) removed during construction needs to be stockpiled separately from terrestrial soils.
- Stockpiled wetland soil should be demarcated, kept free of weeds and is not to be compacted.
- Wetland soils are to be handled twice only, firstly to strip and stockpile, and secondly to replace, level, shape and reinstate wetland vegetation.
- Depending on timescales of construction, the stockpiled soil may need to be kept moist using some form of spray irrigation on a regular basis as appropriate and according to weather conditions.
- Wetland soils are not to be used for construction purposes.
- If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-groundweight construction equipment, or operate normal equipment on riprap or prefabricated equipment mats.

c) Alteration of hydrological functioning of the wetland channel

- Construction should not permanently alter the surface or subsurface flow of water through the wetland.
- Construction materials, including spoil material is not to be stockpiled in wetland/riparian areas.
- Any artificial channels/erosion gullies initiated as a result of construction need to be filled and stabilised once pipeline installation is complete.
- Construction should proceed mainly during the dry, winter months, when flows are low.
- The pipeline will need to be buried at a sufficient depth below the active stream channel to prevent exposure along the channel bed.
- During trenching, flows should be diverted around the section of trench being excavated, to reduce silt loads and ensure flows continue within the channel and to allow for continued ecological functioning of the stream during construction.
- Under no circumstance should consideration be given to the excavation of an alternative channel or the damming of the stream in such a manner as to totally restrict the flow. Water diversion needs to be temporary and only one diversion made at a time.
- An effective roughness element may need to be re-introduced by the fixing of large boulders on to the surface of the pipeline, in order to dissipate flow.

d) Potential pollution of immediate downstream environment

- Any contaminated soil from the construction site needs to be removed and properly disposed of.
- Spillages should be cleaned up immediately, and contaminants properly drained.
- Implement a preventative maintenance system to ensure that work vehicles are maintained in an acceptable condition. This would involve routinely checking vehicles for leaks before construction begins and not allowing vehicles with significant leaks to operate or be repaired within the construction site.
- Drip trays need to be provided for all vehicle repairs.
- The proper storage and handling of hazardous substances (fuels, chemicals and paints) needs to be administered.
- Ensure that appropriate solid waste disposal facilities are provided on-site during construction and adequate signage is provided. Clear and completely remove from site all

general waste, constructional plant, equipment, surplus rock and other materials once construction has been completed. Collected waste needs to be disposed of at a registered landfill site.

- Sanitation – portable toilets to be provided where construction is occurring, and should be located a considerable distance away from wetlands and riparian areas.
- A “Clean-up Kit” containing suitable spillage clean-up equipment must be on-site at all times and used in the event of a spill.
- No mixed concrete shall be deposited directly onto the ground. A batter board or other suitable platform/mixing tray shall be provided onto which any mixed concrete can be deposited whilst it awaits placement.
- Concrete spilled outside of the demarcated area must be promptly removed and taken to a permitted waste disposal site. Wash water from cement is not to be released into the environment. This water must be collected, stored and disposed of at an approved site.
- Fuels, chemicals and other hazardous substances must be stored in suitable containers with lids that remain firmly shut and are shielded from the elements.
- All spillages are to be reported to the Resident Engineer/Clerk of Works and Environmental Officer in charge immediately so that appropriate clean-up measures can be implemented.
- No spills may be hosed down into drains leading to wetlands/riparian areas.
- Any water discharged must comply with the relevant water quality limits/guidelines specified by the Department of Water Affairs.
- Discharge of waste into the environment or burying of waste is strictly prohibited.

e) Erosion and sedimentation from construction activities

- Any erosion gullies/channels created during construction should be filled to ensure silt does not drain into the wetland.
- Spoil from the construction zone should not be placed within the wetland.
- Excavated material would need to be placed in an up-slope direction so that storm flows are likely to wash the sediment into the trench rather than directly into the wetland.
- Sandbags should be placed across the trench in any area where significant flow rates are expected.
- Install sediment barriers/silt curtains along the edge of the pipeline trench as necessary to contain spoil and prevent sediment flow into the wetland. An appropriate silt trap could be in the form of a silt curtain or hay-bales placed end-to-end.
- Dewater the trench in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland area.
- Ensure that the trench is adequately covered and soil pushed down to natural ground level to limit the potential of soil loss from the trench line once construction is complete.
- Water discharged into the environment (e.g. from trench dewatering) must be done in a manner that is not conducive to erosion and does not result in heavily silt-laden water flowing into any wetland/river. One method could be to divert trench water through dense vegetation (to act as a filter) before re-entering the river.
- Bare ground exposed after vegetation removal must be rehabilitated as soon as possible.
- Construction should proceed mainly during the dry, winter months in order to minimize soil erosion linked to high runoff rates.

f) Invasion by exotic plants

- Remove and effectively treat any alien plants in the construction zone during the pipeline construction and operational phase. The use of herbicides will require an investigation into the necessity, type to be used, effectiveness and impacts of the agent on aquatic biota.
- Where possible, cut rather than totally remove indigenous vegetation in the construction

zone to facilitate more rapid re-colonization of disturbed areas.

g) Impact on stream morphology

- Re-directed flow must not be channeled towards stream banks to cause erosion.
- Construct any necessary erosion protection works where the pipeline intersects the macro-channel banks of the stream in order to prevent scouring or bank erosion. Protection works to be considered include gabions, reno mattresses or other stabilising structures. Existing gabions within the stream channel can be exploited but may require upgrading to function properly.
- River sediments/debris are not to be used for construction (eg. rocks for use in gabion baskets/reno mattresses) or to be permanently removed from the system. Removed sediment should be stockpiled for rehabilitation low the elevation of the channel bed.
- Construction should occur during the winter months when flows are low.

h) Disturbance on in-stream habitat

- No physical damage to any aspects of a watercourse (including the riverbed and banks) is permitted, other than those necessary to complete the works as specified.
- Ensure that construction activities are carefully monitored to limit the zone of impact on in-stream habitat.
- Ensure the use of coffer dams/piped culverts and sand bags to re-direct flow and thus allow for a dry construction.
- Riparian areas immediately downstream of the pipeline crossing must be appropriately protected. A layer of coarse immovable material could be used.
- Store excavated soil and sediments away from the riparian zone.
- Undertake the pipeline crossing work during low flow season to reduce the risk of high flow/flood impacts.

In order to install the Pipeline, a trench of 1m wide x 3m deep would need to be excavated. Based on the Aquatic Assessment, the Pipeline may proceed across the channel, but must be buried at sufficient depth of at least 2m or more below the channel bed. Furthermore, the existing gabion barrier may be exploited to trap any sediment washing off the works area and to prevent scouring of the streamline in case of heavy flows and also to provide protection for the downstream section of the wetland, for almost the entire length of the Pipeline across the stream channel and stream banks.

2. Soil and groundwater impacts

- Implement effective measures to prevent or minimise spillage and to contain any spilled hazardous substances that may potentially occur during transportation, off-loading, storage, dispensing, handling, usage and disposal thereof.
- Keep a complete emergency spill kit available on site at all times and ensure that the relevant employee members are trained in the effective use thereof for dealing with spills of hazardous substances (oils, diesel, petrol, paints, herbicides, pesticides, etc.).
- Store all hazardous substances in the dedicated storage areas.
- Keep all toxic and flammable substances under lock and key all the times.
- Seal and store all empty and externally dirty containers that had contained hazardous substances in a bunded area or an area where the ground has been appropriately protected by an impermeable surface.
- Utilise drip trays below small leaks to contain spillage of hazardous substances.
- Stop the source of a spill as soon as possible and contain any spill immediately and

effectively as possible.

- Regard any large spills of hazardous substances or spills of very toxic substances as an emergency incident.
- Clean all hazardous spills and remediate the affected area in accordance with specifications provided by a suitably qualified specialist. Appoint a specialist hazard clean-up service provider to deal with spills of large quantities or very toxic substances.
- Determine if there is any soil, groundwater or other environmental impact and, if so, arrange for the appropriate remediation action to the satisfaction of the relevant authorities.

3. Construction related direct impacts on residents

a) Traffic disturbance and congestion to residents and commuters along affected roads in Assagay

- The planning of the construction programme must be undertaken in cognisance of the traffic impacts.
- Liaise with the eThekweni Traffic and Transportation Department on envisaged traffic impacts and coordinate plans and actions.
- Obtain approval from the eThekweni Transport Authority for any traffic diversions or road closures.
- Inform residents two weeks prior to construction of any proposed road closures.
- Ensure that detours and appropriate signage are available when working in and closing off Gevers Road to traffic.
- Where detours are not available, undertake construction activities during early morning hours.

b) Water interruptions

- Any proposed water interruptions must be advertised at least two weeks prior to interruptions occurring.
- Interruptions must be planned to take place at night time when demand for water is low.
- Any accidental damage to operating water pipes during construction must be repaired immediately to ensure that the duration of water interruptions is kept minimal.

c) Visual and aesthetic impacts of construction site

- Ensure that soils stockpiles from trench excavation are kept neat and situated at equal distances from each other along the construction route.
- The construction camp site must be located in an area that is not visually sensitive.
- Appropriate aesthetically pleasing visual screening of the campsite must be implemented during construction.

d) Noise impact from trench excavation, pipe welding and construction vehicles and equipment

- Restrict noisy construction activities, e.g. jack hammering, to daytime activities to between 07h00 and 17h00, unless otherwise agreed to and approved by the eThekweni Municipality.
- Where possible ensure that all noisy equipment and vehicles are fitted with properly maintained silencers.
- Construction employees must be trained and made aware of not creating unnecessary noise such as hooting and shouting.

4. Water use permits

- Provide a Method Statement for any required or intended abstraction or diverting of water flows from the stream.
- Submit the Method Statement to the PE and ECO for their approval.

5. Environmental Management Programme

- The EMP shall be implemented during the pre-construction, construction and operational phases of the proposed Pipeline (See Appendix F)

Mitigation for Alternative S2 & Alternative S3 is Not Applicable

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative) N/A
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Alternative A2 N/A
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Alternative A3 N/A
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

No-go alternative (compulsory)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:

4. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

Alternative S1 (preferred alternative)

Direct impacts:

- Adequate provision of water to the Summerhills consumers
- Potential re-disturbance of wetland for maintenance activities
- Potential impacts due to maintenance of Pipeline.

Indirect impacts:

- Wetland not adequately rehabilitated resulting in the following potential impacts:
 - Indigenous grasses not re-established
 - Disruption in flow of water through the wetland
 - Continuous erosion of bare ground

Cumulative impacts:

- Reduction in the backlog of water provision by eThekweni Municipality.

Alternative S2 : N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3 N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

None

Indirect impacts:

None

Cumulative impacts:

None

Indicate mitigation measures to manage the potential impacts listed above:

Operational Phase Mitigation Measures	N/A	N/A
<p>1. Potential re-disturbance of wetland for maintenance activities</p> <ul style="list-style-type: none"> Ensure that the design of the Pipeline includes an appropriate concrete casing for the portion traversing the wetland. This casing must ensure protection from damage to the Pipeline and associated requirements for repair. <p>2. Potential impacts due to maintenance of Pipeline</p> <ul style="list-style-type: none"> Implement measures as noted for the construction phase during maintenance activities. <p>3. Potential wetland impacts due to inadequate rehabilitation post construction</p> <p>Although significant impacts have already led to the degradation of the system from its natural state, the presence of wetland soils and the importance of the channel as a functioning stream within the drainage network necessitate the mitigation against impacts that are likely to occur during the construction of the Pipeline, in order to protect the integrity of the immediate and downstream environment.</p> <p>Once construction is completed, or at such time as rehabilitation is deemed applicable, the following guidelines shall be applied in order to rehabilitate disturbed wetland/riparian areas:</p> <p>Phased Rehabilitation Required</p> <p>Phase 1</p> <ul style="list-style-type: none"> Stockpiled wetland soil shall be replaced in the reverse order as to which it was removed (subsoil first followed by topsoil). Reinstated wetland soil is not to be compacted too heavily, as this will prevent water saturation and proper plant growth during rehabilitation. Should significant compaction occur, the area is to be ripped to reduce the bulk density of the soil. The pipeline should ideally be covered with coarse material such as boulders to create habitat diversity. <p>Phase 2</p> <ul style="list-style-type: none"> The pre-construction profile of the stream channel and banks shall be returned to one similar as before construction, with no major net increase in slope transversely or longitudinally. The channel bed should be restored as far as possible to the original condition and stream banks reinstated as close as possible to the original contours in order to reduce potential scouring. 		

<ul style="list-style-type: none"> • All fill material, cofferdams, causeways or any other structures used to provide a footing in the river must be completely removed. • The channel embankments must be rehabilitated to ensure both longitudinal and cross sectional stability against summer floods. Depending on the circumstances, this may necessitate stabilizing structures such as gabions or renomattresses. <p>Phase 3</p> <ul style="list-style-type: none"> • All waste products (spoil, construction materials, hazardous substances and general litter) need to be removed from the stream and disposed of in proper local waste facilities. <p>Phase 4</p> <ul style="list-style-type: none"> • The removal of exotic vegetation species from the disturbed wetland and adjacent areas will need to occur. Implement an integrated alien weed control programme to ensure that alien plants are eradicated from the disturbed site, and so they do not impact on the pipeline itself. <p>Phase 5</p> <ul style="list-style-type: none"> • Once the soil and topography of the riparian zone has been returned to its preconstruction state, and waste products removed, stockpiled riparian vegetation is to be reinstated. Re-instate the area affected with suitable indigenous grasses (Antelope grass) and bulrushes, such as those found at the site. • Stream banks should be re-vegetated as soon as practically possible with indigenous species similar to those occurring in the original habitat. <p>1. Environmental Management Programme</p> <p>The EMP shall be implemented during the pre-construction, construction and operational phases of the proposed Pipeline (See Appendix F)</p>		
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

<p>Alternative A1 (preferred alternative)</p> <p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>
<p>Alternative A2</p> <p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>
<p>Alternative A3</p> <p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p>

<i>Cumulative impacts:</i>
No-go alternative (compulsory)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3

5. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE

a. Site alternatives

The Pipeline is expected to be in operation for at least 30 years before requiring replacement or repair and maintenance. Removal / decommissioning of the pipeline is not expected. Thus, impacts related to the decommissioning and closure of the Pipeline is considered Not Applicable.

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

Alternative S1 (preferred alternative)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>
Alternative S2
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>
Alternative S3
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

No-go alternative (compulsory)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>
Alternative A2
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>
Alternative A3
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>
No-go alternative (compulsory)
<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3

C. PROPOSED MONITORING AND AUDITING

As previously mentioned in Section 3, Alternatives S2 and S3 have been disqualified from further investigation due to a number of factors rendering S2 and S3 unfeasible. As such, the Monitoring and Auditing of S2 and S3 are not applicable.

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)	Alternative S2	Alternative S3
The attached EMP (Appendix F) allows for an Environmental Control Officer (ECO) to be appointed to monitor potential impacts and to ensure that the EMP is implemented at agreed intervals for the duration of the construction phase.	N/A	N/A
Alternative A1 (preferred alternative)	Alternative A2	Alternative A3
N/A	N/A	N/A

D. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to their type, likelihood, duration and the significance.

Methodology for Impact Significance Scoring

The significance (quantification) of potential environmental impacts identified during the Basic Assessment have been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, of the Department of Environmental Affairs and Tourism, April 1998):

Occurrence

- Probability of occurrence (how likely is it that the impact may occur?)
- Duration of occurrence (how long may it last?)

Severity

- Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability	Duration
1 - very improbable (probably will not happen)	1 - of a very short duration (0–1 years)
2 - improbable (some possibility, but low likelihood)	2 - of a short duration (2-5 years)
3 - probable (distinct possibility)	3 - medium-term (5–15 years)
4 - highly probable (most likely)	4 - long term (> 15 years)
5 - definite (impact will occur regardless of any prevention measures)	5 - permanent
Extent	Magnitude
1 - limited to the site	0 - small and will have no effect on the environment
2 - limited to the local area	2 - minor and will not result in an impact on processes
3 - limited to the region	4 - low and will cause a slight impact on processes
4 - will be national	6 - moderate and will result in processes continuing but in a modified way
5 - will be international	8 - high (processes are altered to the extent that they temporarily cease)
	10 - very high and results in complete destruction of patterns and permanent cessation of processes

The environmental significance of each potential impact is assessed using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:

- < 30 significance points = **LOW** environmental significance.
- 31- 60 significance points = **MODERATE** environmental significance
- > 60 significance points = **HIGH** environmental significance

The table below summarises all the identified impacts and their significance ratings without and with mitigation, while detailed descriptions of each impact are provided there under.

Potential Impact	Rating - S1	
	Without mitigation	With mitigation
Construction Phase		
Wetland & stream impacts		
Disturbance of wetland vegetation and habitat	Moderate (-)	Low (-)
Disturbance of wetland soils and alteration of wetland geomorphology	Moderate (-)	Low (-)
Potential pollution of the immediate and downstream environment	Moderate (-)	Low (-)
Erosion and sedimentation due to construction activities	Moderate (-)	Low (-)
Potential invasion by exotic plants	Low (-)	Low (-)
Impact on stream morphology	Low (-)	Low (-)
Alteration of hydrological functioning within the stream channel	Moderate (-)	Low (-)
Disturbance of in-stream habitat	Low (-)	Low (-)
Cumulative impacts on wetland and stream channel	Moderate (-)	Low (-)
Soil and groundwater impacts during construction	Low (-)	Low (-)
Traffic disturbance and congestion to residents	Moderate (-)	Low (-)
Water interruptions	Low (-)	Low (-)
Visual & aesthetic impacts	Low (-)	Low (-)
Noise impacts	Moderate (-)	Low (-)
Operational Phase		
Provision of additional potable water to Summerhills	Moderate (+)	N/A
Potential re-disturbance of wetland for maintenance activities	Low (-)	Low (-)
Potential impacts due to maintenance of Pipeline.	Low (-)	Low (-)
Potential wetland impacts due to inadequate rehabilitation post construction	Moderate (-)	Low (-)
No – Go Alternative		
	High (-)	N/A

Impact Assessment**Construction Phase Impacts**

1. Wetland and stream channel Impacts

The Pipeline is proposed to traverse a channelled wetland area upstream of the culvert beneath Kassier Road at the intersection of Kassier Road and Hlupeka Place. As noted in the Specialist Assessment, the wetland area has been disturbed by past developments in the area, with significantly altered hydrology due to a modified stream channel and the presence of large amounts of exotic plants and trees in the riparian zone. The installation of the Pipeline across the stream channel at this point will have potential impacts on the aquatic environment as detailed below.

a) Disturbance of wetland vegetation and habitat

The disturbance of wetland/riparian vegetation and habitat is anticipated during trenching activities within the proposed construction servitude. In addition, indigenous grasses may also be disturbed. However, mitigation measures will be applied to remove indigenous vegetation for use in rehabilitation post construction. The significance of the potential impact on wetland/riparian vegetation is considered to be **moderate (-) before mitigation** and **low (-) after mitigation.**

Impact significance table: Disturbance of wetland vegetation and habitat					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	8 (6)	2 (1)	5 (2)	55 Moderate	16 Low

b) Disturbance of wetland soils and alteration of wetland geomorphology

The disturbance of wetland soils will occur during trenching, with the excavation and compaction of wetland soils being of primary concern. The potential impact on wetland soils can be effectively mitigated through the implementation of mitigation measures. The significance of the potential impact due to the disturbance of wetland soils and alteration of wetland geomorphology is considered to be **moderate (-) before mitigation** and **low (-) after mitigation.**

Impact significance table: Disturbance of wetland soils and alteration of wetland geomorphology					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	8 (6)	2 (1)	4 (3)	44 Moderate	24 Low

c) Potential pollution of the immediate and downstream environment

Accidental spills of hydrocarbons (oils, diesel, etc) or leakage of such substances from construction machinery/plant may enter the wetland channel directly or through surface

runoff during rainfall events, resulting in soil and water contamination. Solid waste in the form of general litter left by labourers and construction materials (gloves, excess materials, etc) and activities (concrete mixing) may also pollute the wetland. These waste products are highly likely to be transported downstream by the stream, causing pollution of the downstream environment. The significance of the potential impact of pollution on the immediate and downstream environment is considered to be **moderate (-) before mitigation** and **low (-) after mitigation**.

Impact significance table: Potential pollution of the immediate and downstream environment					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	8 (6)	2 (1)	5 (2)	55 Moderate	16 Low

d) Erosion and sedimentation due to construction activities

Disturbance and excavation in the construction zone may lead to sedimentation of the wetland system. Water flowing down trenches and access roads, as well as trench de-watering, could cause additional sediment to accumulate within the wetland area, and could easily pollute downstream aquatic resources through transportation within the channel. The significance of the potential impact on wetland/riparian vegetation is considered to be **moderate (-) before mitigation** and **low (-) after mitigation**.

Impact significance table: Erosion and sedimentation due to construction activities					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (4)	2 (1)	4 (3)	36 Moderate	18 Low

e) Potential invasion by exotic plants

Disturbance to surface soil layers, removal of existing vegetation communities and exposure of bare soil following pipeline installation may provide beneficial conditions for opportunistic and invasive plant species to colonize the construction area. This in turn will lead to changes in wetland vegetation composition and possibly impact on hydrological processes. The significance of the potential impact of the invasion of exotic plants on the wetland is considered to be **low (-) before and after mitigation**.

Impact significance table: Potential invasion by exotic plants					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
2 (1)	6 (4)	2 (1)	3 (2)	30 Low	12 Low

f) Impact on stream morphology

Construction activities associated with trenching in the wetland channel is likely to have an impact on the general morphology of the channel. Stream morphology is the study of a stream's form, structure, and channelisation. There are a large number of complex, interrelated factors that determine riparian form and function which include stream discharge, sediment load, resistance of the banks and bed to movement of flowing water, vegetation, and temperature. Changes in these variables will cause an adjustment of the dynamic

equilibrium of streams, which could lead to unstable stream channels and loss of fish and invertebrate habitat. The significance of the potential impact on morphology of the stream is considered to be **low (-) before and after mitigation.**

Impact significance table: Impact on stream morphology					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	4 (2)	1 (1)	2 (1)	12 Low	4 Low

g) Alteration of hydrological functioning within the stream channel

The installation of the pipeline within the channel is likely to alter the existing hydrological regime temporarily, largely as a result of localised interception and/or disruption to flow. However, the existing gabion structure within the channel may potentially reduce the significance of this impact by attenuating storm flows and providing some form of erosion control and channel stabilisation within the stream. The significance of the potential impact on hydrological functioning of the channel is considered to be **moderate (-) before mitigation** and **low (-) after mitigation.**

Impact significance table: Alteration of hydrological functioning within the stream channel					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (4)	2 (1)	5 (4)	40 Moderate	24 Low

h) Disturbance of in-stream habitat

Construction activities may damage aspects of the watercourse, including the riverbed bank banks and in-stream habitat, if not carefully monitored. The significance of the potential impact on in-stream habitat is considered to be **low (-) before and after mitigation.**

Impact significance table: Disturbance of in-stream habitat					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (4)	2 (1)	3 (2)	27 Low	12 Low

i) Cumulative impacts on wetland and stream channel

A number of potential impacts on the wetland and stream channel have been identified for the construction phase of the Pipeline. While all of the individual impacts can be mitigated effectively, the combination of all the impacts requires additional mitigation as prescribed in this BAR. The significance of potential cumulative impacts on the wetland and stream channel can be considered to be **moderate (-) before mitigation** and **low(-) after mitigation** during and after construction of the Pipeline.

Impact significance table: Cumulative impacts on wetland and stream channel					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	8 (6)	2 (1)	3 (2)	33 Moderate	16 Low

2. Soil and groundwater impacts during construction

Construction activities may result in the spillage of hazardous material such as fuel and oil which could lead to soil and groundwater contamination. However, this can be effectively mitigated with the implementation of the EMP. The potential soil and groundwater impacts due to the construction of the Pipeline are considered as **low (-) in significance before and after mitigation.**

Impact significance table: Soil and groundwater impacts					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (4)	2(1)	3 (2)	27 Low	12 Low

3. Construction related impacts on residents

The main issues raised by IAPs through the PPP were related to construction activities. It is important to note that these impacts will only last for the duration of the construction period, which is expected to be one week per 100m of Pipeline installation. Construction related impacts on residents are detailed below.

a) Traffic disturbance and congestion to residents

The intention is to install the Pipeline within the road reserve along the route alignment in Assagay. This may, at most, require that one lane of a certain road be closed for the period of construction there, which is one (1) week per 100m of pipeline. In addition, due to the Pipeline crossing Gevers Road, this road will have to be closed during the installation of this section.

It should be noted that some of the roads have narrow verges with major bends, which can be dangerous during construction if not adequately mitigated. In addition, construction along Frasers Road will potentially cause traffic disturbance for people leaving the Shongweni Farmers Market on one Saturday morning. Traffic impacts on residents due to the construction of the pipeline is considered to be **moderate (-) in significance before mitigation and low after mitigation.**

Impact significance table: Traffic disturbance and congestion to residents					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (2)	2 (1)	4 (3)	36 Moderate	12 Low

a. Water interruptions

EWS has stated that water interruptions will be kept to a minimum, with only one scheduled shut down being recognised, which will most likely occur during off peak time between 22:00 and 06:00. Any water interruptions occurring during the day may likely be as a result of accidental damage to existing reticulation water mains along the route, or household connections, during excavation. The significance of the impact on residents due to water interruptions is considered as **low (-) before and after mitigation.**

Impact significance table: Impact of water interruptions					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	4 (2)	1 (1)	2 (1)	12 Low	4 Low

b. Visual and aesthetic impacts

Trenching along the route will include the excavation of roads, verges and driveways within the eThekweni Municipality owned road reserve. Excavated material would need to be stockpiled adjacent to areas of construction which could result in a visual impact if not properly maintained. A construction campsite will also be established to accommodate piping and associated attachments, which may also result in a visual impact if not kept neat, properly maintained and visually screened. The campsite is proposed to be established on an open field along Fraser Road, in close proximity to the site where the weekly Shongweni Farmers Market is held. These construction activities may result in visual impacts and detract from the aesthetic appeal of the area. The significance of visual and aesthetic impacts is considered to be **low (-) before and after mitigation.**

Impact significance table: Visual and aesthetic impacts					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	2 (2)	1 (1)	2 (2)	8 Low	8 Low

c. Noise impacts

Noise will be generated by construction vehicles and construction activities such as trench excavation, pipe welding. These activities and associated noise may pose a nuisance to residents along the proposed construction route alignment. The significance of potential noise impacts during construction can be considered as **moderate (-) before mitigation** and **low (-) after mitigation.**

Impact significance table: Noise impacts					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	6 (4)	1 (1)	4 (3)	32 Moderate	18 Low

Operational Phase Impacts

1. Provision of additional potable water to Summerhills

The main motivation for the proposed Pipeline is to accommodate for current and future water demands of the growing Summerhills community. The significance of the potential positive impact of water provision to the community is considered as **high (+) in significance.**

Impact significance table: Provision of additional potable water to residents of Summerhills					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
4	2	2	5	40 Moderate	N/A

2. Potential re-disturbance of wetland for maintenance activities

The portion of the Pipeline that will traverse the wetland area will be housed in a concrete casing that would be secured to prevent potential damage to the Pipeline and associated leaks. Due to this casing, as well as the fact that the Pipeline will be constructed from steel, it is unlikely that any maintenance activities will be carried out on the Pipeline within the wetland itself. The significance of potential re-disturbance of wetland for maintenance activities of the Pipeline is therefore considered to be **low (-) before and after mitigation.**

Impact significance table: Potential re-disturbance of wetland for maintenance activities					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	4 (0)	1 (1)	2 (1)	12 Low	2 Low

3. Potential impacts due to maintenance of Pipeline

The proposed Pipeline will be a gravity fed steel pipeline and will not include any pump stations. This design enables a 'self-cleaning' pipeline that requires little to no maintenance. However, should the pipeline be accidentally damaged through construction activities or maintenance, repair of the pipeline will be required, albeit very unlikely. The maintenance activities as a result of accidental damage to the pipeline may result in impacts similar to those described above for construction related impacts. This may include noise impacts, traffic disturbance, visual and aesthetic impacts, disturbance to residents and water supply interruptions. The significance of potential impacts due to maintenance of the Pipeline is considered to be **low (-) before and after mitigation.**

Impact significance table: 3. Potential impacts due to maintenance of Pipeline					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
1 (1)	2 (0)	1 (1)	3 (2)	12 Low	2 Low

4. Potential wetland impacts due to inadequate rehabilitation post construction

Potential exists for the following impacts to occur, should rehabilitation not be implemented adequately post construction:

- Indigenous grasses not re-established
- Disruption in flow of water through the wetland
- Continuous erosion of bare ground.

However, a detailed rehabilitation plan has been compiled by the Wetland Specialist, INR, which has been included in the EMP. Should this plan be implemented post construction as prescribed, the potential impacts on the wetland during the operational phase of the Pipeline will be effectively mitigated. The significance of the wetland impact during the operational phase of the Pipeline is considered to be **moderate (-) before mitigation/rehabilitation** and **low (-) after mitigation/rehabilitation**.

Impact significance table: Wetland not adequately rehabilitated post construction					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
4 (1)	8 (2)	2 (1)	4 (2)	56 Moderate	8 Low

Alternative S3

Alternative A1 (preferred alternative)

Alternative A2

Alternative A3

No-go alternative (compulsory)

The potential impact associated with the No-Go Alternative is as follows:

Additional supply of water needed by the growing Summerhills community will not be supplied and the EWS will not be able to fulfil its mandate to supply potable water to consumers. The impact of the No-go Alternative is therefore considered to be of **high (-) significance**.

Impact significance table: No-go Alternative					
Duration	Magnitude	Extent	Probability	Significance Without mtg	Significance With mtg
4	10	2	5	80 High	N/A

E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner). **YES**

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Overall Recommendation

The impacts that have been identified for the preferred and only feasible alternative S1, can all be mitigated to acceptable levels. Thus, no fatal flaws or unacceptable impacts would occur through the construction of the Assagay Trunk Water Main. The proposed project will supply additional water in line with the expected near future demands of the Summerhills area.

Additionally, the following can be noted for S1:

- The route alignment will largely run along eThekweni Municipality owned road servitude (apart from a small section on Kassier Road) and is therefore available for construction
- No private property will be traversed
- It would require the least amount of water interruptions as there is only one reticulation line along the route
- There is sufficient space throughout the route alignment within the road reserve to install the new pipeline
- The preferred alignment does not affect the Department of Transport's planned expansion of Kassier Road
- While there will be impacts on residents during the construction phase, these impacts will be of a short duration, maximum of 1 week per kilometre and can be effectively mitigated.

For these reasons, Arcus GIBB recommends that the Assagay Trunk Water Main Project be awarded Environmental Authorisation and that the No-go Alternative not be considered.

The following measures are recommended for the mitigation of identified impacts: The preferred alternative, S1,

Construction Phase Mitigation Measures

1. Wetland and stream impacts

a) Disturbance of wetland vegetation and habitat

- The construction zone should be clearly demarcated prior to the commencement of construction activities to ensure that activities do not unduly disturb the wetland/riparian zone ("No-go" areas outside of the construction zone should be defined).
- Minimise the width of the construction servitude across the wetland zone.
- Areas to be cleared of vegetation will need to be demarcated.
- Once identified, indigenous wetland plant species (*Typha capensis* mainly) requiring removal shall be removed appropriately with their root ball intact.
- Wetland vegetation removed shall be stockpiled neatly on the periphery of the area being stripped, for use in wetland rehabilitation.
- Stockpiled vegetation is to be properly demarcated such that it is not unnecessarily disturbed by construction activities.
- Wetland vegetation should be placed in a shaded area or covered using an appropriate material and kept moist.
- Any indigenous grasses may be retained for use in rehabilitation of the channel.
- Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation.

b) Disturbance of wetland soils and alteration of wetland geomorphology

- Servitude width should be minimised as far as possible within the wetland zone.
- Wetland topsoil (top 300mm) removed during construction needs to be stockpiled separately from terrestrial soils.
- Stockpiled wetland soil should be demarcated, kept free of weeds and is not to be compacted.
- Wetland soils are to be handled twice only, firstly to strip and stockpile, and secondly to replace, level, shape and reinstate wetland vegetation.
- Depending on timescales of construction, the stockpiled soil may need to be kept moist using

some form of spray irrigation on a regular basis as appropriate and according to weather conditions.

- Wetland soils are not to be used for construction purposes.
- If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-groundweight construction equipment, or operate normal equipment on riprap or prefabricated equipment mats.

c) Alteration of hydrological functioning of the wetland channel

- Construction should not permanently alter the surface or subsurface flow of water through the wetland.
- Construction materials, including spoil material is not to be stockpiled in wetland/riparian areas.
- Any artificial channels/erosion gullies initiated as a result of construction need to be filled and stabilised once pipeline installation is complete.
- Construction should proceed mainly during the dry, winter months, when flows are low.
- The pipeline will need to be buried at a sufficient depth below the active stream channel to prevent exposure along the channel bed.
- During trenching, flows should be diverted around the section of trench being excavated, to reduce silt loads and ensure flows continue within the channel and to allow for continued ecological functioning of the stream during construction.
- Under no circumstance should consideration be given to the excavation of an alternative channel or the damming of the stream in such a manner as to totally restrict the flow. Water diversion needs to be temporary and only one diversion made at a time.
- An effective roughness element may need to be re-introduced by the fixing of large boulders on to the surface of the pipeline, in order to dissipate flow.

d) Potential pollution of immediate downstream environment

- Any contaminated soil from the construction site needs to be removed and properly disposed of.
- Spillages should be cleaned up immediately, and contaminants properly drained.
- Implement a preventative maintenance system to ensure that work vehicles are maintained in an acceptable condition. This would involve routinely checking vehicles for leaks before construction begins; and not allowing vehicles with significant leaks to operate or be repaired within the construction site.
- Drip trays need to be provided for all vehicle repairs.
- The proper storage and handling of hazardous substances (fuels, chemicals and paints) needs to be administered.
- Ensure that appropriate solid waste disposal facilities are provided on-site during construction and adequate signage is provided. Clear and completely remove from site all general waste, constructional plant, equipment, surplus rock and other materials once construction has been completed. Collected waste needs to be disposed of at a registered landfill site.
- Sanitation – portable toilets to be provided where construction is occurring, and should be located a considerable distance away from wetlands and riparian areas.
- A “Clean-up Kit” containing suitable spillage clean-up equipment must be on-site at all times and used in the event of a spill.
- No mixed concrete shall be deposited directly onto the ground. A batter board or other suitable platform/mixing tray shall be provided onto which any mixed concrete can be deposited whilst it awaits placing.
- Concrete spilled outside of the demarcated area must be promptly removed and taken to a

permitted waste disposal site. Wash water from cement is not to be released into the environment. This water must be collected, stored and disposed of at an approved site.

- Fuels, chemicals and other hazardous substances must be stored in suitable containers with lids that remain firmly shut and are shielded from the elements.
- All spillages are to be reported to the Resident Engineer/ Clerk of Works and Environmental Officer in charge immediately so that appropriate clean-up measures can be implemented
- No spills may be hosed down into drains leading to wetlands/riparian areas.
- Any water discharged must comply with the relevant Water Quality limits/guidelines specified by the Department of Water Affairs.
- Discharge of waste into the environment or burying of waste is strictly prohibited.

e) Erosion and sedimentation from construction activities

- Any erosion gullies/channels created during construction should be filled to ensure silt does not drain into the wetland.
- Spoil from the construction zone should not be placed within the wetland.
- Excavated material would need to be placed in an up-slope direction so that storm flows are likely to wash the sediment into the trench rather than directly into the wetland.
- Sandbags should be placed across the trench in any area where significant flow rates are expected.
- Install sediment barriers/silt curtains along the edge of the pipeline trench as necessary to contain spoil and prevent sediment flow into the wetland. An appropriate silt trap could be in the form of a silt curtain or hay-bales placed end-to end.
- Dewater the trench in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland area.
- Ensure that the trench is adequately covered and soil pushed down to natural ground level to limit the potential of soil loss from the trench line once construction is complete.
- Water discharged into the environment (eg. from trench dewatering) must be done in a manner that is not conducive to erosion and does not result in heavily silt-laden water flowing into any wetland/river. One method could be to divert trench water through dense vegetation (to act as a filter) before re-entering the river.
- Bare ground exposed after vegetation removal must be rehabilitated as soon as possible.
- Construction should proceed mainly during the dry, winter months in order to minimize soil erosion linked to high runoff rates.

f) Invasion by exotic plants

- Remove and effectively treat any alien plants in the construction zone during the pipeline construction and operational phase. The use of herbicides will require an investigation into the necessity, type to be used, effectiveness and impacts of the agent on aquatic biota.
- Where possible, cut rather than totally remove indigenous vegetation in the construction zone to facilitate more rapid re-colonization of disturbed areas.

g) Impact on stream morphology

- Re-directed flow must not be channeled towards stream banks to cause erosion.
- Construct any necessary erosion protection works where the pipeline intersects the macro-channel banks of the stream in order to prevent scouring or bank erosion. Protection works to be considered include gabions, reno mattresses or other stabilising structures. Existing gabions within the stream channel can be exploited but may require upgrading to function properly.
- River sediments/debris are not to be used for construction (eg. rocks for use in gabion

baskets/reno mattresses) or to be permanently removed from the system. Removed sediment should be stockpiled for rehabilitation low the elevation of the channel bed.

- Construction should occur during the winter months when flows are low.

h) Disturbance on in-stream habitat

- No physical damage to any aspects of a watercourse (including the riverbed and banks) is permitted, other than those necessary to complete the works as specified.
- Ensure that construction activities are carefully monitored to limit the zone of impact on in-stream habitat.
- Ensure the use of coffer dams/piped culverts and sand bags to re-direct flow and thus allow for a dry construction.
- Riparian areas immediately downstream of the pipeline crossing must be appropriately protected. A layer of coarse immovable material could be used.
- Store excavated soil and sediments away from the riparian zone.
- Undertake the pipeline crossing work during low flow season to reduce the risk of high flow/flood impacts.

In order to install the Pipeline, a trench of 1m wide x 3m deep would need to be excavated. Based on the Aquatic Assessment, the Pipeline may proceed across the channel, but must be buried at sufficient depth of at least 2m or more below the channel bed. Furthermore, the existing gabion barrier may be exploited to trap any sediment washing off the works area and to prevent scouring of the streamline in case of heavy flows and also to provide protection for the downstream section of the wetland, for almost the entire length of the Pipeline across the stream channel and stream banks.

2. Soil and groundwater impacts

- Implement effective measures to prevent or minimise spillage and to contain any spilled hazardous substances that may potentially occur during transportation, off-loading, storage, dispensing, handling, usage and disposal thereof.
- Keep a complete emergency spill kit available on site at all times and ensure that the relevant employee members are trained in the effective use thereof for dealing with spills of hazardous substances (oils, diesel, petrol, paints, herbicides, pesticides, etc.).
- Store all hazardous substances in the dedicated storage areas.
- Keep all toxic and flammable substances under lock and key all the times.
- Seal and store all empty and externally dirty containers that had contained hazardous substances in a bunded area or an area where the ground has been appropriately protected by an impermeable surface.
- Utilise drip trays below small leaks to contain spillage of hazardous substances.
- Stop the source of a spill as soon as possible and contain any spill immediately and effectively as possible.
- Regard any large spills of hazardous substances or spills of very toxic substances as an emergency incident.
- Clean all hazardous spills and remediate the affected area in accordance with specifications provided by a suitably qualified specialist. Appoint a specialist hazard clean-up service provider to deal with spills of large quantities or very toxic substances.
- Determine if there is any soil, groundwater or other environmental impact and, if so, arrange for the appropriate remediation action to the satisfaction of the relevant authorities.

3. Construction related direct impacts on residents

a) Traffic disturbance and congestion to residents and commuters along affected roads in Assagay

- The planning of the construction programme must be undertaken in cognisance of the traffic impacts.
- Liaise with the eThekweni Traffic and Transportation Department on envisaged traffic impacts.
- Obtain approval from the eThekweni Transport Authority for any traffic diversions or road closures.
- Inform residents two weeks prior to construction of any proposed road closures
- Ensure that detours and appropriate signage are available when working in and closing Gevers Road to traffic.
- Where detours are not available, undertake construction activities during early morning hours.

b) Water interruptions

- Any proposed water interruptions must be advertised at least two weeks prior to interruptions occurring.
- Interruptions must be planned to take place during nighttime when demand for water is low.
- Any accidental damage to operating water pipes during construction must be repaired immediately to ensure that the duration of water interruptions is kept minimal.

c) Visual and aesthetic impacts of construction site

- Ensure that soils stockpiles from trench excavation are kept neat and situated at equal distances from each other along the construction route.
- The construction camp site must be located in an area that is not visually sensitive.
- Appropriate aesthetically pleasing visual screening of the campsite must be implemented during construction.

d) Noise impact from trench excavation, pipe welding and construction vehicles and equipment

- Restrict noisy construction activities, e.g. jack hammering, to daytime activities to between 07h00 and 19h00, unless otherwise agreed to and approved by eThekweni Municipality and adjacent landowners.
- Ensure that all vehicles and where possible, noisy equipment, are fitted with silencers that are properly maintained.
- Construction employees must be trained and made aware of not creating unnecessary noise such as hooting and shouting.

4. Water use permits

- Obtain the necessary approvals/permits from the relevant authorities, e.g. the Department of Water Affairs and eThekweni Water Services, for the abstraction or diversion of water from the stream.
- Provide a Method Statement for any required abstraction or diverting of water flows from the stream .
- Submit the Method Statement to the PE and ECO for their approval.

5. Environmental Management Programme

The EMP shall be implemented during the pre-construction, construction and operational phases of the proposed Pipeline (See Appendix F).

Operational Phase Mitigation Measures

1. Potential re-disturbance of wetland for maintenance activities

- Ensure that the design of the Pipeline includes an appropriate concrete casing for the portion traversing the wetland. This casing must ensure protection from damage to the Pipeline and associated requirements for repair.

2. Potential impacts due to maintenance of Pipeline

- Implement measures as noted for the construction phase during maintenance activities.

3. Potential wetland impacts due to inadequate rehabilitation post construction

Although significant impacts have already led to the degradation of the system from its natural state, the presence of wetland soils and the importance of the channel as a functioning stream within the drainage network necessitate the mitigation against impacts that are likely to occur during the construction of the Pipeline, in order to protect the integrity of the immediate and downstream environment.

Once construction is completed, or at such time as rehabilitation is deemed applicable, the following guidelines shall be applied in order to rehabilitate disturbed wetland/riparian areas:

Phased Rehabilitation Required

Phase 1

- Stockpiled wetland soil shall be replaced in the reverse order as to which it was removed (subsoil first followed by topsoil).
- Reinstated wetland soil is not to be compacted too heavily, as this will prevent water saturation and proper plant growth during rehabilitation.
- Should significant compaction occur, the area is to be ripped to reduce the bulk density of the soil.
- The pipeline should ideally be covered with coarse material such as boulders to create habitat diversity.

Phase 2

- The pre-construction profile of the stream channel and banks shall be returned to one similar as before construction, with no major net increase in slope transversely or longitudinally.
- The channel bed should be restored as far as possible to the original condition and stream banks reinstated as close as possible to the original contours in order to reduce potential scouring.
- All fill material, cofferdams, causeways or any other structures used to provide a footing in the river must be completely removed.
- The channel embankments must be rehabilitated to ensure both longitudinal and cross sectional stability against summer floods. Depending on the circumstances, this may

necessitate stabilizing structures such as gabions or renomattresses.

Phase 3

- All waste products (spoil, construction materials, hazardous substances and general litter) need to be removed from the stream and disposed of in proper local waste facilities.

Phase 4

- The removal of exotic vegetation species from the disturbed wetland and adjacent areas will need to occur. Implement an integrated alien weed control programme to ensure that alien plants are eradicated from the disturbed site, and so they do not impact on the pipeline itself.

Phase 5

- Once the soil and topography of the riparian zone has been returned to its preconstruction state, and waste products removed, stockpiled riparian vegetation is to be reinstated. Re-instate the area affected with suitable indigenous grasses (Antelope grass) and bulrushes, such as those found at the site.
- Stream banks should be re-vegetated as soon as practically possible with indigenous species similar to those occurring in the original habitat.

4. Environmental Management Programme

The EMP shall be implemented during the pre-construction, construction and operational phases of the proposed Pipeline (See Appendix F).

APPENDICES

The following appendixes must be attached as appropriate:

- Appendix A: Site plan(s)
- Appendix A1: Figure 1: Locality Map
- Appendix A2: Figure 2: Pipeline Route Alternatives

- Appendix B: Photographs

- Appendix C: Coordinates at 500m intervals

- Appendix D: Specialist Reports
- Appendix D1: Specialist Aquatic Assessment
- Appendix D2: Specialist Geology and Excavation Assessment
- Appendix D3: Specialist Heritage Impact Assessment

- Appendix E: Public Participation Process Information
- Appendix E1: Interested & Affected Party Database
- Appendix E2: Media notices
- Appendix E3: Notice Boards
- Appendix E4 : Background Information Document
- Appendix E5: Comments and Response Report
- Appendix E6 : Copies of IAP Comments and Correspondence
- Appendix E7: Copies of Authority Comments and Correspondence

- Appendix F: Environmental Management Programme